STATE-WIDE SEAT BELT USAGE SURVEY

AND ANALYSIS

Summer 2005

For

Project # 0402

The Office of Traffic Safety
State of California

And

National Highway Traffic Safety Administration
Washington, DC

Raul Betancourt, PhD
CSUF Foundation, MS 123
California State University, Fresno
Fresno, California 93740-0090

STATE OF CALIFORNIA

OCCUPANT RESTRAINT USAGE SURVEY
REPORT FOR SUMMER, 2005[1]

OTS CONTRACT #0402

This report[2] covers surveys conducted during the summer of 2005. It is presented in four parts. Part I describes the goals and objectives, procedures and survey methodology. Part II shows the results using NHTSA data reporting criteria. Part III tables the results on CHP designated highways by occupant and CHP division groupings. Part IV summarizes usage results for this period.

BACKGROUND

A. GENERAL CHARACTERISTICS

The State of California is approximately 800 miles long and 200 miles wide. Its total area is 158,704 square miles with 40,152,100 acres of forest land. California ranks first in the United States in population. The State has over 32 million people, living in 58 counties, 513 cities and 57 non incorporated areas. It has a population density of 207.0 per sq. mile and is about 87.5% urban. Net migration into the state in 1999 was over 300,000. The principal industries of California are agriculture, aerospace, manufacturing, construction, and recreation.

B. STREETS AND HIGHWAYS

California has about 164,000+ miles of roadways including 15,206 miles of State highway and freeways. Freeways traverse the state primarily in a north and south direction due to the north-south coastal and inland mountain ranges.

C. OPERATING DEPARTMENTS

The CSUF Foundation, subcontractor and project administrator, is a non-profit corporation formed in 1931 and operates exclusively to receive, hold, invest and administer property and make expenditures to or for the benefit of California State University, Fresno. It is a recognized auxiliary organization of CSUF, Fresno as determined by the Board of Trustees of the California State University and Colleges. The primary purposes of this corporation is to promote and assist the educational services of the California State University, Fresno, including acquisition and maintenance of real property, scholarships, student loans, and faculty and program development.

D. EXISTING SYSTEMS

California State University, Fresno is part of the nineteen-campus California State University system. It has approximately 20,500 students with 2000 faculty and staff. The CSU, Fresno Grants and Contracts Office and the CSUF, Foundation is responsible for obtaining and monitoring University grants. An important function of the foundation is to administer research projects, workshops, institutes, and conferences for the purposes of furthering the study, teaching, assimilation, and disbursement of knowledge that furthers the educational and social objectives of the California State University system. The foundation has a full time staff, with modern facilities including computer systems, committed to the servicing of its clients. With over $20 million in research grants Foundation personnel are experienced and efficient in meeting the accounting and oversight requirements of the various grants.

[1] This project is a part of the California Traffic Safety Program and was made possible through the support of the California Office of Traffic Safety, State of California, and the National Highway Traffic Safety Administration.

[2] The opinions, findings, and conclusions expressed in this publication are those of the authors and not necessarily those of the State of California, the National Highway Traffic Safety Administration, or the Federal Highway Administration.

PART I

GOALS & OBJECTIVES

PROBLEM STATEMENT

OTS and NHTSA are interested in whether California drivers are increasing their use of automobile safety restraints as the result of the enacted California law. The following questions were asked:

What effect has the California seat belt law had on seat restraint usage rates of California drivers?

What effect has the California seat belt law had on seat restraint usage rates of California passengers?

What effect has the California seat belt law had on seat restraint usage rates of California infants and toddlers?

ATTEMPTS TO SOLVE PROBLEM

Studies and Surveys: The project consultant conducted a seat restraint usage survey funded by NHTSA and SJVHC between November, 1983 and September, 1984 in Fresno County. The observations included seat belt usage rates of drivers, passengers, and infants.

NHTSA surveys in San Jose, Santa Clara, and Sacramento counties collected data on several thousand vehicles over several years time. Data on many of the same demographic distinctions were made in these studies. Data was collected at MacDonald's restaurants in different clearly defined socioeconomic sections in the city of Fresno. Socioeconomic differences in seat usage rates were found.

OTS funded seat restraint surveys from 1985 through 2004 were sponsored by California State University Fresno (CSUF) and the CSUF Foundation. Data were collected, analyzed, and a project summary report submitted to OTS at the end of each survey. Project final reports were submitted and accepted by OTS at the end of each contract period. In the summer of 1992 the NHTSA mandated a probability methodology for all funded projects. A survey methodology based upon probability sampling was submitted by the project director to NHTSA in summer, 1992 to their statistical department and approved. The first of these surveys was in the fall of 1992.

PROJECT GOALS

The major goal for this project is:

To conduct a statewide survey in summer of 2005 of seat belt usage rates to aid NHTSA, OTS, and the CHP in evaluating the effectiveness of their traffic safety programs, enhanced media and enforcement efforts, and other related program issues.

PROJECT OBJECTIVES

To use a sampling frame for the three statewide surveys having a probability of sampling at least 85% of the State's population.

To use a probability based methodology for sampling 80 highway and 80 non-highway sites.

To record seat belt restraint usage of drivers, passengers, and children 0-4 years of age (infant/toddlers) in automobiles, vans, and pickups at 80 sites selected on non-highway roadways in 40 areas of the state.
To record seat belt restraint usage of drivers, passengers, and infant/toddlers in automobiles, vans, and pickups at 80 sites on selected on highways in 40 areas of the state.

To use the probability based methodology to sample the eight CHP divisions in the statewide surveys.

To record seat belt restraint usage of drivers, passengers, and infant/toddlers in automobiles, vans, and pickups on 117 randomly selected highway sites in the eight CHP divisions of the state.

To establish observer's data collection accuracy and reliability on seat restraint surveying techniques for all sites based upon established methodology to obtain an inter rater reliability of at least .95.

To analyze the data after sampling using criteria and statistics approved by the NHTSA.

To provide written reports and survey results to OTS, NHTSA, and CHP.

To provide data and survey results to other State projects as requested.

To perform other activities in "Method of Procedures" in accordance with the project agreement.

To e-mail or fax all press releases or media advisories/alerts to the OTS Regional Coordinator for approval in advance of their release.

To use the following standard language in all press materials: "Funding for this program was provided by a grant from the California Office of Traffic Safety through the Business, Transportation & Housing Agency".

To submit print clips by 9 a.m. to the OTS Regional Coordinator and the OTS Public Information Officer, by fax at (916) 262-2960. All clips should include publication name and date the article was published.

To FAX to OTS (916) 262-2960, at least a month in advance, a short description of any new traffic safety event or program. Address the fax to the OTS Public Information Officer and the OTS Program Coordinator.

METHOD OF PROCEDURE

PHASE I-PROGRAM PREPARATION (JUNE 15, 2005 TO JUNE 30, 2005)

Task 1. The project director and project consultant will review the survey methodology for summer 2005. Project Procedures will be evaluated using the methodology previously approved by the statistical office of the NHTSA. There are three sampling designs: (a) a statewide sampling of 80 non-highway sites and 80 highway sites; (b) sampling of additional highway sites for the CHP; and (c) a pre-post sampling of 100 sites in additional areas of the State.

A: SAMPLING (STATEWIDE NHTSA SAMPLING):

This probability design for the statewide surveys incorporates two frames: *highway* (H) and *non- highway* (NH). Each frame, in turn, uses a multiple stage cluster sampling procedure where clusters (sites), roadways, and vehicles are sampled. The design samples geographical points throughout the entire state (excluding national and state forests and parks, military installations, protected areas, desert, water areas, etc.).

Two frames are necessary since the primary figure for the design is *average daily traffic* (ADT) which is known before selection for highways (H) but only post hoc for non-highways (NH). Highway ADT figures are published for all highways mileposts in the state and sampling uses the "1993 Traffic Volumes on California state roads" published by the California Department of Transportation. ADT figures for NH are available from city and county publications and surveys but the listings are incomplete. Consequently, ADT for NH are collected after sampling when the sites were known.

Non-Highway Sampling:

Non-highway (NH) selection is a geographically based random sampling procedure. The state is divided into 110 MAPS of equal area measuring 37.5 miles wide and 50 miles deep. The California Road Atlas published by Thomas Brothers, (page B) is organized in this manner. Enlarged detailed maps of each map are provided in the atlas as well. Seventy (70) maps, and parts of maps, are deleted because of a) remoteness, being outside of California borders, b)

national and state forest areas, c) large desert areas, d) Federal and State military areas, and e) waterway and recreational areas. Partial map areas are combined, e.g., maps 15 and 16, to make complete equally sized maps.

Stage I: A random selection of 80 sites (two per map) from the 40 geographical maps is made. The use of paired selection of sites in the analysis follows Leslie Kish's recommendations (see Biography) and is an equal probability paired selection of unequal clusters (sites) from each map. If a selection is not valid a null is recorded and another made. The "# of sites sampled" is the number of times potential sites are selected in each map before a valid site is obtained. Thus, if the first two selections are in water regions and the third selection results in a "valid" site (roadways within the 1/8 mile square area) the figure entered here is three (3).

Stage II. A roadway point intersecting the site selected is chosen. If no roadway intersects then the closest roadway point within an eighth of a mile of the site point is chosen. If two or more roadways are within this quarter mile square then a random selection is made and the roadway(s) that were not selected are counted as nulls and labeled "# of Roads in sampled area".

Stage III: A disproportionate probability selection of vehicles is made using post hoc ADT measures. The selection is proportional to the site ADT.

$$Fax\ Fb = \frac{\#\ of\ sites\ sampled}{Total\ Sites\ in\ State} \times \frac{1}{\#\ of\ Roads\ in\ sampled\ area} \times \frac{\#\ of\ observ\ at\ site}{Site\ ADT}$$

Highway Sampling:

The highway (H) design is an equal probability proportional to size (PPS) sample of a stratified cluster design. State highway ADT figures are derived from "The 1993 Traffic Vol. on California State Highways" published by CalTrans. This volume lists the ADT at approximately each milepost on all state highways. It covers 195 pages with about 35 average daily traffic mileposts per page. The site sampling procedure is:

Stage I: The page with the highest cumulative ADT is found in order to calculate the highest cumulative ADT possible for any page. Random number lists from 1 to cumulative ADT are generated. Each of the 195 pages are considered a stratum and used to select the sites. Pairs of stratum are formed by pairing contiguous sites on each page.

Stage II: A systematic sample of 100 autos is made at each site. The selection ratio is based upon the site ADT.

$$Fax\ Fb = \frac{\#\ SITES_{(ADTsite)}}{ADT_{total}} \times \frac{SAMPLE\ SIZE}{ADT_{site}}$$

Infant/Toddler Sampling: A two stage sampling design is used with all infant/toddlers being observed. The probability selection equations for non-highways and highways are:

Non-Highway Selection Equation:

$$Fax\ Fb = \frac{\#\ of\ sites\ sampled}{Total\ Sites\ in\ State} \times \frac{\#\ of\ minutes\ observed}{Total\ Daily\ minutes}$$

Highway Selection Equation:

$$Fax\ Fb = \frac{\#\ SITES_{(ADTsite)}}{ADT_{total}} \times \frac{\#\ Minutes\ Observ}{Total\ Daily\ Mins.}$$

The "# of minutes observed" is approximately 60 minutes; until 100 vehicles are recorded.

B: CHP Division Sampling:

The highway (H) design is an equal probability (PPS) sample of a stratified cluster design. State highway ADT figures are derived from "The 1993 Traffic Vol. on Calif. State Highways", published by the California Department of Transportation. This volume lists the ADT at approximate mileposts on all state highways.

Stage I: A listing of all highways and freeways under the jurisdiction of the CHP and within each of the eight CHP divisions is made. The cumulative ADT for each division is found. Ten sites are randomly selected between 1 and n (where n = cumulative ADT on a division's roadways).

Stage II: A sample of 100 autos is observed at each site. The selection ratio is based upon ADT.

Highway Occupants (not Infants/Toddlers) Selection Equation:

$$Fax\ Fb = \frac{\#\ DIV\ SITES\ (ADT_{div\ site})}{ADT_{(div\ total)}} \quad X \quad \frac{SAMPLE\ SIZE}{ADT_{(div\ site)}}$$

CHP Infant/Toddler Selection: A two stage sampling design is used with all infant/toddlers being observed. The probability selection equations for highway divisions are:

Highway Infant/Toddler Selection Equation:

$$Fax\ Fb = \frac{\#\ DIV\ SITES\ (ADT_{div\ site})}{ADT_{(div\ total)}} \quad X \quad \frac{\#\ Minutes\ Observ}{Total\ Daily\ Mins.}$$

The "# of minutes observed" in Fb is usually 60.

Task 2. Special Pre and Post Test Preparations: The pre-post surveys design is a probability (PPS) sample of four areas of the State identified as having consistently low seat restraint usage rates. One hundred sites will be selected and 25 survey sites will be selected using census, tract, block groups, income, and rural-urban factors. Surveys will commence on the 100 sites five weeks before Thanksgiving of 2002 and before Memorial Day of 2003. Post surveys will commence immediately after these holidays.

PHASE II – TRAINING (July 1 2005 to July 10, 2005)

Task 3. The project coordinator selected data collectors (surveyors) based upon the criteria as described in the Project Management Manual for Seat Restraint Surveys.

Task 4. The project coordinator conducted training sessions for selected data collectors consisting of the following steps:

a) Assembled surveyors and explained project details and data collection requirements in detail

b) Distributed data collection forms, pay and travel forms and explained correct usage

c) Took groups of four surveyors to city and highway intersections and overpasses and reviewed data collection procedures

d) Had pairs of surveyor's record seat restraint usage on the same vehicles and compared results;

e) Paired the project director and a surveyor to record seat restraint usage on the same vehicles and compared results

f) Paired a newer surveyor with a more experienced one to record seat restraint usage on the same vehicles and compared results. Procedures were continued until a reliability of .95 was achieved between data collectors.

PHASE III – IMPLEMENTATION (July 10, 2005 to August 30, 2005)

Task 6. Observers were sent to selected sites statewide using the following protocols.

Observation Period: A randomly selected day in a contiguous group of four days of the week was selected. For each selected day the data collectors were given four randomly selected sites and directions of traffic in a geographical area of the state approximately 4000 square miles (2 maps). Randomly selected hours of the day were assigned to the sites. The observation period began at the hour assigned and ended when 100 automobiles were recorded.

Observation of Vehicles: A systematic selection of vehicles using ADT in the sampling action was required. Data collectors worked in teams, observing the same vehicles. One member, the caller, randomly selected a lane of traffic, selected a vehicle and informed the second data collector (the recorder) which vehicle to sample. Sampling for a sample size of 100 is based upon the site ADT. For practical and logistical reasons data collectors sampled each site for about one hour (30 minutes in the A.M. and P.M, respectively).

Data Recording: Data collectors recorded use of seat belt by driver, passenger, infant/toddler, and type of vehicle, site location, and time of day, day of week and identification number on the forms provided.

PHASE IV – STATISTICAL ANALYSIS OF SURVEY RESULTS (July 11 to October 30, 2005)

Task 7. Statistical analysis programs were written by the project coordinator. They were used to aggregate survey results for NHTSA, national, and State CHP and OTS seat belt programs requesting local and state data on past and present surveys.

Task 8. The project coordinator compiled, validated, and analyzed data. Results will be printed and mailed to OTS and interested agencies when completed.

PHASE V – DATA GATHERING AND ANALYSIS (Throughout Project Period)

Data relating to the project goals and objectives were collected, analyzed, and incorporated in Quarterly Reports. Quarterly reports for the quarter ending on September 30 will include year-to-date comparisons of goals and objectives.

These reports compared actual project accomplishments with the planned accomplishments. They included information concerning changes made by the Project Director in planning and guiding the project efforts.

The following are some of the methods used for the monitoring and evaluation of the project:

A. Computerized Reports

Statistical information concerning data listed in the project goals and objectives will be available on a timely basis throughout the project. Results from the OTS and CHP surveys will be analyzed using the CARP statistical package, checked by Leslie Kish's formulations (see Biography) and summarized in quarterly reports. Frequency results will be analyzed using SPSS statistical software. Programs will be written to generate needed statistics. Statistical summaries will interpret usage rates by vehicle occupant and calculate a weighted State average usage rate for the OTS and the CHP sections of the report. Point estimates and sampling errors will be calculated. A relative precision of five (5) percent is established.

B. Activity logs.

CSU, Fresno will expect the Project Director to initiate a log system for recording all activities taking place during the project. This information will be used to validate and confirm communications, activities, and future plans and evaluate the effectiveness of procedures and personnel. Close supervision of the project and project personnel is maintained by the Project Director who will consult with the project coordinator and initiate project procedures as needed to fulfill the stated objectives.

PHASE VI – FINAL PROJECT REPORTS AND EXECUTIVE SUMMARY

The final report and executive summary will be written in accordance with OTS requirements. They will be submitted to OTS within 60 days after the grant ends.

METHOD OF EVALUATION. Using the data compiled, the project director evaluated: (1) how well the stated project goals and objectives were accomplished; (2) if all the activities outlined in the Method of Procedures were performed in accordance with the grant agreement; and (3) the project cost effectiveness.

STATEMENT OF INTENT. It is the intent of California State University, Fresno to absorb the any costs resulting in the management and execution of this project. There were four phases of survey activities consisting of: a) preparation; b) data collection; c) analysis, and d) reporting. Activities for the project year 2004 will be described.

PROBLEMS. Inclement weather was encountered a few times and schedules had to be changed to accommodate this problem. Construction at several sites, limiting and/or restricting access, was also a disrupting factor. However, they posed no serious threat to the project. The most serious problem was the standard errors associated with infant and toddler data. Since seeing infants and toddlers in vehicles was rare (3% to 7% of vehicle occupants) their sample sizes tended to be very small at many sites. In addition, the difficulties of accurately recording seat restraint usage in the back seats of large vehicles such as SUV's and through tinted windows in many vehicles are serious. The most obvious solution would be to design and implement a survey solely for the purpose of gathering infant and toddler usage rates.

Part II

Results

Statistics used to calculate the results included ratio mean percentages and standard errors. The relative precision (coefficient of variation of the ratio mean) and the design effect statistic (ratio of reduction in proportionate sampling as compared to simple random sampling) were also calculated. However, only the ratio mean and standard error statistics are given in the following tables.

Table A below shows seat belt usage rates for the summer of 2005 at 80 highways and 80 non highway sites throughout the state. The rates were calculated from one data set of the combined occupant and vehicle data, i.e., driver, passenger and infant/toddler rates were merged into one data set to give the rates shown. This is also true for Tables B, C, D, and E.

Table A

NON-HIGHWAY & HIGHWAY RATES
ALL VEHICLES & ALL OCCUPANTS
SUMMER of 2005

OTS 0402

Statistics	COMBINED OCCUPANT/VEHICLE RATES		
	NON-HIGHWAY	HIGHWAY	COMBINED
USAGE RATE:	91.959	93.029	92.536
PROPORTIONAL ADT:	0.4609	0.5391	1.000
STANDARD ERRORS:	0.993	0.317	0.629
SAMPLE SIZES:	11858	14158	26016
	Confidence Intv (95%)	*91.304*	to *93.768*

	YEARLY COMBINED RATES				
	2001	2002	Sum 2003	Sum 2004	Sum 2005
USAGE RATE:	91.099	91.055	91.241	90.397	92.536
STANDARD ERRORS:	0.812	0.971	0.554	0.506	0.629

OTS\SUMMER 2005\TABLE-A

Table B below shows driver data for highways and non-highways as well as a combined rate.

Table B

ALL VEHICLES - NON-HIGHWAY & HIGHWAY RATES

DRIVERS ONLY

OTS 0402

SUMMER of 2005

COMBINED OCCUPANT/VEHICLE RATES

Statistics	NON-HIGHWAY	HIGHWAY	COMBINED*
USAGE RATE:	91.582	93.542	92.639
PROPORTIONAL ADT:	0.4609	0.5391	1.000
STANDARD ERRORS:	1.074	0.338	0.677
SAMPLE SIZES:	8119	9727	17846
Confidence Intv (95%):		*91.311 to 93.966*	

OTS\SUMMER 2005\TABLE B

*Obtained by CARP analysis

Table C below shows passenger data for highways and non highways as well as a combined rate.

Table C

ALL VEHICLES - NON-HIGHWAY & HIGHWAY RATES

PASSENGERS ONLY

SUMMER of 2005

OTS 0402

COMBINED OCCUPANT/VEHICLE RATES

Statistics	NON-HIGHWAY	HIGHWAY	COMBINED
USAGE RATE:	93.096	91.805	92.400
PROPORTIONAL ADT:	0.4609	0.5391	1.000
STANDARD ERRORS:	1.383	0.723	1.027
SAMPLE SIZES:	3051	3906	6957
Confidence Intv (95%):		*90.387* *to* *94.413*	

OTS\SUMMER 2005\TABLE C

Table D

ALL VEHICLES - NON-HIGHWAY & HIGHWAY RATES

INFANT/TODDLER ONLY

SUMMER of 2005

OTS 0402

COMBINED OCCUPANT/VEHICLE RATES

Statistics	NON-HIGHWAY	HIGHWAY	COMBINED
USAGE RATE:	87.563	86.289	86.876
PROPORTIONAL ADT:	0.4609	0.5391	1.000
STANDARD ERRORS:	1.673	2.438	2.085
SAMPLE SIZES:	688	525	1213
Confidence Intv (95%):		*82.789 to 90.964*	

OTS\SUMMER 2005\TABLE D

Table E

SPRING 2005 vs SUMMER 2005

TEST FOR SIGNIFICANT MEAN DIFFERENCES

SPRING and SUMMER of 2005

OTS 0402

	COMBINED OCCUPANT/VEHICLE RATES			
Statistics	SPRING 2005	SUMMER 2005	Difference	Test of sign*
COMBINED HIGHWAY & NON HIGHWAY	90.369	92.536	-2.167	-1.792
STD ERRORS	1.033	0.629	1.209	Sign @ .05
NON HIGHWAYS	89.171	91.959	-2.788	-1.499
STD ERRORS NON HWY	1.611	0.993	1.86	NS @ .05
HIGHWAYS	91.394	93.029	-1.635	-2.619
STD ERRORS HWY	0.538	0.317	0.6244	Sign @ .01

OTS PROJECTS/SUMMER 2005/TABLE E

* One tailed

Tables F through I show rates for twelve major California cities.
The rates are by year, 2002 through 2005, type of vehicle, and occupant status.

TABLE F

USAGE RATES BY OCCUPANT AND VEHICLE
in CALIFORNIA CITIES
YEARS 2002 - 2005

OTS 0402

R E D D I N G

	AUTOMOBILE					*VAN*					*PICKUP*				
OCCUPANT	2002	Spr 03	Sum 03	Sum 04	Sum 05	2002	Spr 03	Sum 03	Sum 04	Sum 05	2002	Spr 03	Sum 03	Sum 04	Sum 05
DRIVER	85.7	86.0	93.0	96.9	96.4	86.4	90.0	87.5	91.2	89.1	86.5	87.1	89.5	87.5	83.7
PASSENGER	90.9	83.3	86.7	95.0	94.5	85.7	85.7	87.5	95.8	92.6	90.5	73.7	100.0	82.6	72.7
INFANT/ * TODDLER	97.7	98.2	100.0	100.0	100.0	100.0	99.1	100.0	100.0	100.0	100.0	97.8	none	100.0	100.0

S A C R A M E N T O

	AUTOMOBILE					*VAN*					*PICKUP*				
OCCUPANT	2002	Spr 03	Sum 03	Sum 04	Sum 05	2002	Spr 03	Sum 03	Sum 04	Sum 05	2002	Spr 03	Sum 03	Sum 04	Sum 05
DRIVER	92.9	86.7	92.9	92.3	94.8	90.1	91.4	95.3	94.4	97.5	84.0	84.0	94.9	91.1	85.0
PASSENGER	91.1	90.5	93.9	12.1	96.3	82.1	100.0	97.0	7.3	100.0	75.0	100.0	96.6	12.0	82.6
INFANT/ * TODDLER	100.0	100.0	95.0	100.0	84.2	75.0	98	100.0	100.0	100.0	100.0	none	none	100.0	100.0

S A N F R A N C I S C O

	AUTOMOBILE					*VAN*					*PICKUP*				
OCCUPANT	2002	Spr 03	Sum 03	Sum 04	Sum 05	2002	Spr 03	Sum 03	Sum 04	Sum 05	2002	Spr 03	Sum 03	Sum 04	Sum 05
DRIVER	93.0	95.2	88.2	90.9	94.5	91.2	89.5	87.2	95.3	94.8	93.8	66.7	94.7	88.9	100.0
PASSENGER	90.7	88.9	78.3	84.8	94.5	100.0	90.9	60.0	86.2	96.8	none	*	75.0	91.7	100.0
INFANT/ * TODDLER	100.0	100.0	100.0	100.0	96.8	100.0	*	100.0	100.0	100.0	none	none	none	100.0	100.0

\ots\quar\summer 2005\Table F

*Some passenger, infant/toddler and pickup sample sizes are too small to make these rates meaningful.
These many times result in seat belt usage rates of 100%.

Table G

USAGE RATES BY OCCUPANT AND VEHICLE
in CALIFORNIA CITIES
YEARS 2002 - 2005

OTS 0402

F R E S N O

	AUTOMOBILE					*VAN*					*PICKUP*				
OCCUPANT	2002	Spr 03	Sum 03	Sum 04	Sum 05	2002	Spr 03	Sum 03	Sum 04	Sum 05	2002	Spr 03	Sum 03	Sum 04	Sum 05
DRIVER	88.7	80.9	89.5	94.5	88.3	95.0	90.0	100.0	93.2	86.4	77.4	73.9	88.2	80.6	73.7
PASSENGER	89.2	91.7	90.0	100.0	91.5	80.0	100.0	87.5	90.6	94.0	75.8	60.0	85.7	75.0	82.8
INFANT/ * TODDLER	71.4	85.7	100.0	91.7	64.3	73.7	75.0	100.0	100.0	96.7	42.9	none	none	100.0	62.5

M O N T E R E Y

	AUTOMOBILE					*VAN*					*PICKUP*				
OCCUPANT	2002	Spr 03	Sum 03	Sum 04	Sum 05	2002	Spr 03	Sum 03	Sum 04	Sum 05	2002	Spr 03	Sum 03	Sum 04	Sum 05
DRIVER	89.3	82.1	94.4	93.0	93.1	88.5	100	95.7	90.0	96.7	85.2	83.3	71.4	84.6	92.6
PASSENGER	80.0	75.9	85.7	93.9	90.5	92.9	*	100.0	96.0	94.1	75.0	*	100.0	69.2	100.0
INFANT/ * TODDLER	88.9	100	71.4	88.0	100.0	none	*	100.0	100.0	100.0	none	*	none	100.0	none

S A L I N A S

	AUTOMOBILE					*VAN*					*PICKUP*				
OCCUPANT	2002	Spr 03	Sum 03	Sum 04	Sum 05	2002	Spr 03	Sum 03	Sum 04	Sum 05	2002	Spr 03	Sum 03	Sum 04	Sum 05
DRIVER	87.5	88.2	85.7	88.8	92.3	81.8	100.0	92.9	82.4	88.2	91.7	66.7	80.0	78.4	85.7
PASSENGER	81.0	100.0	100.0	75.6	94.4	none	80.0	100.0	94.1	88.9	77.8	*	50.0	90.0	66.7
INFANT/ * TODDLER	76.9	50.0	100.0	88.9	100.0	none	100.0	75.0	100.0	100.0	100.0	none	none	100.0	none

\OTS\Summr 2005\Table G

* Many sample sizes too small to be meaningful.

Table H

USAGE RATES BY OCCUPANT AND VEHICLE
in CALIFORNIA CITIES
YEARS 2002 - 2005

OTS 0402

S A N L U I S O B I S P O

	AUTOMOBILE					*VAN*					*PICKUP*				
OCCUPANT	2002	Spr 03	Sum 03	Sum 04	Sum 05	2002	Spr 03	Sum 03	Sum 04	Sum 05	2002	Spr 03	Sum 03	Sum 04	Sum 05
DRIVER	92.4	94.2	94.7	94.2	92.8	96.0	88.6	100.0	89.2	100.0	83.1	75.9	85.7	79.0	90.3
PASSENGER	87.9	88.9	92.2	90.5	93.5	90.9	81.3	80.0	95.0	100.0	70.8	66.7	83.3	81.8	100.0
INFANT/ * TODDLER	97.1	100	100.0	100.0	89.5	100	99.7	100.0	100.0	100.0	100	none	none	100.0	none

B A K E R S F I E L D

	AUTOMOBILE					*VAN*					*PICKUP*				
OCCUPANT	2002	Spr 03	Sum 03	Sum 04	Sum 05	2002	Spr 03	Sum 03	Sum 04	Sum 05	2002	Spr 03	Sum 03	Sum 04	Sum 05
DRIVER	91.1	93.4	96.5	90.5	90.7	95.2	97.4	92.0	93.5	92.8	84.2	83.3	87.5	77.8	75.0
PASSENGER *	80.4	88.7	85.7	82.5	88.2	91.4	92.3	94.1	82.5	86.5	82.9	88.9	76.9	82.6	70.7
INFANT/ * TODDLER	70.8	87.1	33.3	63.6	73.1	80.0	70	none	83.3	82.4	25.0	none	0.0	0.0	37.5

R I V E R S I D E

	AUTOMOBILE					*VAN*					*PICKUP*				
OCCUPANT	2002	Spr 03	Sum 03	Sum 04	Sum 05	2002	Spr 03	Sum 03	Sum 04	Sum 05	2002	Spr 03	Sum 03	Sum 04	Sum 05
DRIVER	86.4	82.9	91.3	86.8	87.8	92.3	72.7	89.7	97.4	88.7	62.5	none	81.6	92.3	85.9
PASSENGER *	85.7	83.3	86.0	89.3	86.2	77.8	83.3	88.5	85.0	92.9	50.0	none	76.9	100.0	88.4
INFANT/ * TODDLER	52.2	100	60.0	60.0	100.0	88.9	none	73.3	100.0	80.0	none	none	none	100.0	100.0

\OTS\Summer 2005\Table H

* Some passenger and infant/toddler sample sizes are too small to be meaningful

Table I

USAGE RATES BY OCCUPANT AND VEHICLE
in CALIFORNIA CITIES
YEARS 2002 - 2005

OTS 0402

S A N B E R N A R D I N O

	AUTOMOBILE					*VAN*					*PICKUP*				
OCCUPANT	2002	Spr 03	Sum 03	Sum 04	Sum 05	2002	Spr 03	Sum 03	Sum 04	Sum 05	2002	Spr 03	Sum 03	Sum 04	Sum 05
DRIVER	75.0	89.7	93.4	83.1	92.1	78.3	83.3	78.8	85.0	92.5	84.2	80.0	80.8	70.6	82.7
PASSENGER	82.1	66.7	78.0	86.1	89.0	58.3	100	84.6	80.0	89.1	75.0	66.7	66.7	71.4	78.1
INFANT/ * TODDLER	75.0	81.6	70.0	72.7	87.5	100.0	80	66.7	100.0	100.0	50.0	55	100.0	50.0	100.0

L O S A N G E L E S

	AUTOMOBILE					*VAN*					*PICKUP*				
OCCUPANT	2002	Spr 03	Sum 03	Sum 04	Sum 05	2002	Spr 03	Sum 03	Sum 04	Sum 05	2002	Spr 03	Sum 03	Sum 04	Sum 05
DRIVER	93.9	87.6	87.8	86.7	87.5	89.5	77.8	86.3	89.0	94.0	92.1	69.2	88.5	81.6	88.1
PASSENGER	87.1	87.5	72.4	84.6	85.9	none	85.7	93.3	80.4	94.9	70.0	60.0	100.0	66.7	84.2
INFANT/ * TODDLER	94.7	92.9	100.0	72.0	70.6	none	95	none	80.0	80.0	none	none	0.0	66.7	100.0

S A N D I E G O

	AUTOMOBILE					*VAN*					*PICKUP*				
OCCUPANT	2002	Spr 03	Sum 03	Sum 04	Sum 05	2002	Spr 03	Sum 03	Sum 04	Sum 05	2002	Spr 03	Sum 03	Sum 04	Sum 05
DRIVER	93.0	87.1	97.5	87.6	91.6	91.9	87.5	97.7	94.7	91.4	87.3	75.6	84.2	82.4	82.7
PASSENGER	89.1	91.7	93.8	81.1	96.8	93.8	87.5	100.0	81.3	97.1	76.2	100	50.0	94.1	92.9
INFANT/ * TODDLER	96.2	100	100.0	85.6	96.2	100.0	none	100.0	92.6	96.7	none	none	none	77.4	none

\OTS\Summer 2005\Table I

* Some passenger and infant/toddler sample sizes are too small to be meaningful
Seat belt rates of 100% often are due to very small sample sizes

PART III

Tables 1 through 9 show usage rates for all vehicles combined.
Table 10 shows the combined rates of all occupants in all vehicles.

Table 1

CHP DIVISION ONE
NORTHERN

YEARS 2001 - 2005

OTS 0402

DRIVERS

Year	2001	2002	Spr 2003	Sum 2003	Sum 2004	Sum 2005
TOTAL DRIVERS:	1506	1121	1100	1104	1114	1100
RATIO MEAN:	90.90	91.00	93.27	94.93	91.56	92.27
STANDARD ERROR:	2.876	0.856	1.069	0.661	0.833	0.640

PASSENGERS

						Sum 2005
TOTAL PASSENGERS:	623	515	434	510	510	423
RATIO MEAN:	87.64	89.32	91.24	91.76	89.87	91.14
STANDARD ERROR:	3.294	1.362	1.92	1.219	1.402	0.920

INFANTS

						Sum 2005
TOTAL INFANTS:	49	22	22	100	103	28
RATIO MEAN:	93.88	90.91	90.3	90.00	99.03	100.00
STANDARD ERROR:	2.423	6.272	3.512	3.015	0.931	0.000

\OTS\Summer 2005\Table 1.

Table 2

CHP DIVISION TWO
VALLEY

YEARS 2001 - 2005

OTS 0402

DRIVERS						
Year	2001	2002	Spr 2003	Sum 2003	Sum 2004	Sum 2005
TOTAL DRIVERS:	1109	599	598	596	605	700
RATIO MEAN:	92.79	92.32	93.31	95.3	92.56	97.71
STANDARD ERROR:	2.588	1.089	1.446	.868	1.068	0.846

PASSENGERS						Sum 2005
TOTAL PASSENGERS:	420	186	222	294	205	230
RATIO MEAN:	91.19	87.10	92.79	94.56	91.71	93.48
STANDARD ERROR:	2.837	2.464	2.466	1.325	1.931	1.631

INFANTS						Sum 2005
TOTAL INFANTS:	54	21	44	24	28	17
RATIO MEAN:	85.19	100.00	90.91	100	100	88.24
STANDARD ERROR:	3.586	0.000	6.272	0.00	0	8.055

\OTS\Summer 2005\Table 21.

Table 3

CHP DIVISION THREE
GOLDEN GATE

YEARS 2001 - 2005

OTS 0402

DRIVERS

Year	2001	2002	Spr 2003	Sum 2003	Sum 2004	Sum 2005
TOTAL DRIVERS:	1836	1400	1408	1404	1404	1403
RATIO MEAN:	93.95	93.64	92.76	90.88	93.45	96.29
STANDARD ERROR:	2.383	0.652	0.978	0.769	0.661	0.506

PASSENGERS

						Sum 2005
TOTAL PASSENGERS:	766	560	602	462	531	371
RATIO MEAN:	93.34	92.86	91.69	86.58	90.58	94.61
STANDARD ERROR:	2.494	1.089	1.593	1.587	1.269	1.174

INFANTS

						Sum 2005
TOTAL INFANTS:	766	560	602	462	22	33
RATIO MEAN:	93.34	92.86	91.69	86.58	100	93.94
STANDARD ERROR:	2.494	1.089	1.593	1.587	0	4.218

\OTS\Summer 2005\Table 3.

Table 4

CHP DIVISION FOUR
CENTRAL

YEARS 2001 - 2005

OTS 0402

	DRIVERS					
Year	2001	2002	Spr 2003	Sum 2003	Sum 2004	Sum 2005
TOTAL DRIVERS:	1908	700	750	698	696	998
RATIO MEAN:	85.12	92.00	91.2	91.98	92.39	93.48
STANDARD ERROR:	3.561	1.026	1.465	1.029	1.001	0.929

	PASSENGERS					Sum 2005
TOTAL PASSENGERS:	977	370	354	380	362	571
RATIO MEAN:	80.25	87.84	86.44	87.37	89.23	89.92
STANDARD ERROR:	3.984	1.702	2.581	1.706	1.632	1.365

	INFANTS					Sum 2005
TOTAL INFANTS:	101	9	8	38	72	22
RATIO MEAN:	59.41	66.67	100	78.95	83.33	77.27
STANDARD ERROR:	4.936	16.667	0	6.703	4.423	9.144

\OTS\Summer 2005\Table 4.

Table 5

CHP DIVISION FIVE
SOUTHERN

YEARS 2001 - 2005

OTS 0402

	DRIVERS					
Year	2001	2002	Spr 2003	Sum 2003	Sum 2004	Sum 2005
TOTAL DRIVERS:	2200	2200	2223	2200	2199	2100
RATIO MEAN:	91.68	91.18	86.73	90.91	89.09	92.05
STANDARD ERROR:	2.762	0.605	1.023	0.613	0.665	0.591

	PASSENGERS					Sum 2005
TOTAL PASSENGERS:	779	556	664	640	707	854
RATIO MEAN:	87.68	83.09	82.23	82.5	85.15	89.45
STANDARD ERROR:	3.289	1.591	2.101	1.503	1.339	0.958

	INFANTS					Sum 2005
TOTAL INFANTS:	90	50	56	68	99	118
RATIO MEAN:	93.33	90.00	89.29	82.35	80.81	72.88
STANDARD ERROR:	2.508	4.285	5.952	4.658	3.978	4.110

\OTS\Summer 2005\Table 5.

Table 6

CHP DIVISION SIX
BORDER

YEARS 2001 - 2005

OTS 0402

DRIVERS						
Year	2001	2002	Spr 2003	Sum 2003	Sum 2004	Sum 2005
TOTAL DRIVERS:	1318	1200	1224	1200	1199	1300
RATIO MEAN:	89.68	89.58	86.11	92.67	89.49	92.38
STANDARD ERROR:	3.043	0.882	1.399	0.753	0.886	0.736

PASSENGERS						Sum 2005
TOTAL PASSENGERS:	426	354	320	328	446	480
RATIO MEAN:	79.58	89.27	84.38	94.51	85.87	91.00
STANDARD ERROR:	4.036	1.648	2.879	1.260	1.651	1.371

INFANTS						Sum 2005
TOTAL INFANTS:	47	20	24	46	16	149
RATIO MEAN:	89.36	95.00	62.5	100	75.00	98.66
STANDARD ERROR:	3.116	5.000	10.094	0.000	11.180	3.404

\OTS\Summer 2005\Table 6

Table 7

CHP DIVISION SEVEN
COASTAL

YEARS 2001 - 2005

OTS 0402

	DRIVERS					
Year	2001	2002	Spr 2003	Sum 2003	Sum 2004	Sum 2005
TOTAL DRIVERS:	1011	899	902	816	901	901
RATIO MEAN:	92.58	93.44	89.58	92.89	93.34	96.56
STANDARD ERROR:	2.659	0.826	1.440	0.900	0.831	0.608

	PASSENGERS					Sum 2005
TOTAL PASSENGERS:	391	443	322	344	432	367
RATIO MEAN:	90.79	88.49	91.30	90.70	93.06	94.01
STANDARD ERROR:	2.895	1.518	2.228	1.568	1.225	1.241

	INFANTS					Sum 2005
TOTAL INFANTS:	26	46	38	76	82	22
RATIO MEAN:	100.00	82.61	100	92.11	91.46	86.30
STANDARD ERROR:	0.000	5.650	0.0	3.113	3.104	7.490

\OTS\Summer 2005\Table 7.

Table 8

CHP DIVISION EIGHT
INLAND

YEARS 2001 - 2005

OTS 0402

DRIVERS

Year	2001	2002	Spr 2003	Sum 2003	Sum 04	Sum 2005
TOTAL DRIVERS:	1116	1130	1102	1198	1097	1100
RATIO MEAN:	85.84	82.30	85.30	89.48	86.42	92.36
STANDARD ERROR:	3.487	1.136	1.510	0.887	1.035	0.801

PASSENGERS

						Sum 2005
TOTAL PASSENGERS:	556	560	366	602	511	548
RATIO MEAN:	84.71	79.64	81.42	88.7	85.52	90.88
STANDARD ERROR:	3.601	1.703	2.883	1.291	1.558	1.231

INFANTS

						Sum 2005
TOTAL INFANTS:	68	102	18	112	92	44
RATIO MEAN:	70.59	61.76	77.78	71.73	76.09	90.91
STANDARD ERROR:	4.590	4.836	10.394	4.288	4.471	4.384

\OTS\Summer 2005\Table 8.

Table 9

CHP - ALL DIVISIONS
COMBINED OCCUPANT RATES*

YEARS 2001 - 2005

OTS 0402

DRIVERS

Year	2001	2002	Spr 2003	Sum 2003	Sum 2004	Sum 2005
TOTAL DRIVERS:	12004	9249	9307	9216	9215	9602
RATIO MEAN:	90.30	90.59	89.23	91.97	91.83	93.57
STANDARD ERROR:	2.961	0.304	.455	0.283	0.421	0.250

						Sum 2005
TOTAL PASSENGERS:	4938	3544	3284	3560	3658	3861
RATIO MEAN:	86.59	86.99	87.33	88.82	88.522	91.87
STANDARD ERROR:	3.407	0.565	0.821	0.528	0.662	0.440

						Sum 2005
TOTAL INFANTS:	538	319	238	604	514	433
RATIO MEAN:	84.20	81.19	87.79	84.44	86.393	88.45
STANDARD ERROR:	3.651	2.191	2.872	1.476	2.286	1.538

\OTS\Summer 2005\Table 9.

Table 10

ALL CHP DIVISIONS

COMBINED RATES
by Division

YEARS 2000 - 2005

OTS 0402	Survey Period/Year						
Division	2000	2001	2002	Spr 2003	Sum 2003	Sum 2004	SUM 2005
1 NORTHERN	88.73	90.03	90.48	92.66	93.70	91.55	91.76
2 VALLEY	96.36	92.11	91.32	93.05	95.19	92.60	97.17
3 GOLDEN GATE	94.20	93.93	93.48	92.54	89.94	92.74	95.90
4 CENTRAL	94.2	82.66	90.36	89.75	89.97	90.80	91.15
5 SOUTHERN	92.73	90.71	89.36	85.76	88.86	87.89	90.10
6 BORDER	95.00	87.27	89.50	85.40	93.27	88.38	92.28
7 COASTAL	94.83	92.22	91.50	90.33	92.23	93.15	95.34
8 INLAND	58.14	84.88	80.3	84.25	88.19	85.59	91.59
ALL DIV*	89.14	89.93	90.23	88.93	90.92	91.01	93.03

\OTS\Spring 2005\Table 10 2005.

PART IV - SUMMARY

Table 10 below summarizes the rates obtained since June, 1985. It should be noted that the data gathering Methodology changed in the summer of 1992 to a probability sampling plan.

Table 11

STATEWIDE ESTIMATES OF SEAT BELT RESTRAINT USAGE *

(Autos only until 1996 then all vehicles and occupants combined)

OTS \Sum 2005\Table 11 — **June, 1985 through August, 2005** — OTS # 4201OTS # 4201

Survey Periods	DRIVERS	PASSENGERS	INFANTS	COMBINED *
JUNE '85	18.4	24.5	36.8	n/a
FEBRUARY '86	47.0	40.1	41.6	n/a
JUNE '86	46.7	37.2	60.4	n/a
NOVEMBER '86	42.6	37.1	68.7	n/a
JUNE '87	46.9	40.3	73.8	n/a
NOVEMBER '87	49.3	40.7	75.7	n/a
JUNE '88	50.6	41.9	80.1	62.2
NOVEMBER '88	51.1	42.5	79.0	61.6
JUNE '89	54.3	43.3	73.1	62.3
NOVEMBER '89	52.3	32.1	62.4	66.5
JUNE '90	56.5	45.5	68.3	67.8
NOVEMBER '90	57.8	55.5	69.6	66.7
JUNE '91	55.2	54.7	61.9	70.8
NOVEMBER '91	63.5	63.8	62.7	70.7
JUNE '92	65.6	66.7	60.0	69.9
SUMMER 1992	70.2	67.4	n/a	n/a
NOVEMBER 1992	64.2	61.8	59.4	66.5
NOVEMBER 1993	82.9	81.0	78.1	n/a
NOVEMBER 1994	83.8	81.3	89.5	n/a
JUNE 1995	84.7	79.8	76.7	n/a
JUNE 1996	88.8	84.9	84.3	86.6
JUNE 1997	89.6	86.0	89.6	86.4
JUNE 1998	91.2	87.7	80.3	88.6
JUNE 1999	90.3	80.0	85.9	89.3
JUNE 2000	89.8	86.6	84.7	88.9
JUNE 2001	91.5	90.1	87.6	91.1
JUNE 2002	91.56	89.07	85.57	91.1
JUNE 2003	89.2	87.3	87.8	89.6
AUGUST 2003	92.2	88.0	86.6	91.2
AUGUST 2004	91.1	86.9	89.6	90.4
AUGUST 2005	**92.6**	**92.4**	**86.9**	**92.5**

*** Combined city and freeway with ADT as weighting factor. Combined rates for drivers only until 1996 after which all occupants and vehicles were aggregated to give the "COMBINED " rate. Rates are from the CARP analysis.**

** The Calif. primary belt law became effective 1/01/93.

NOTE: From summer of 1992 to the present the approved probability sampling NHTSA methodology was used. Prior to Summer, 1992 a simple ADT weighting with a simple random sampling assumption was used.

This project was initiated by NHTSA as a response to Section 153 of Title 23, Section 1031, ISTEA. The California State University, Fresno is the administrative grant recipient. The CSUF, Foundation is the subcontractor with Amy Chubb, PhD as project director and Raul Betancourt, PhD, project consultant.

The problem statement is whether California's seat belt usage law is having an effect on vehicle occupant usage rates throughout the State. The primary goal is to provide data on usage rates to NHTSA, OTS, and CHP officials and project personnel. Project objectives detail aspects of the primary goal.

A probability sampling methodology was designed and submitted to the NHTSA in 1992 by the Project Director and approved. At least 85% of the State's vehicles were included in the sampling frames. Sampling for this phase and the gathering of data proceeded after preliminary site inspections were made and training sessions conducted. . Eighty non-highway and 80 highway sites were selected and sampled. Additional CHP sites were also sampled. Data on automobile driver and passenger seat belt usage rates were collected for evaluation of the methodology in the spring of 2001

.

NHTSA Analysis:

A primary usage rate statistic combining all occupants (drivers, passengers), all vehicles (automobiles, vans, SUVs, pickup trucks) and all types of roadways (highway, non-highway) into ONE data set was required. The overall rate increased in the summer of 2005 to 92.536%. (Table A). It was a statistically significant increase from the spring 2005 rates (Table E). The standard error was 0.629 and within NHTSA criteria.

OTS Analyses:

Tables B and C show the combined highway and non-highway rates for drivers and passengers, respectively. These can be compared with the past years to gauge the impact of seat belt enforcement and use.

Automobile rates for DRIVERS (Table B) increased to 92.639% in the summer of 2005. PASSENGER rates were about the same as the spring 2004 rates.

Infant/toddler rates (Table D) were based upon smaller sample sizes per vehicle category resulting in larger standard errors but they were all within NHTSA criteria. The combined infant/toddler summer rate was at 86.876%.

Simple weighted rates for the twelve California cities used in surveys from 1985 to the present (Tables F through I). Rates were calculated by occupant status and type of vehicle. These provide comparisons from 2002 to the present. It should be noted that rates of 100% are a consequence, in many cases, of very small sample sizes. This is especially true for pickup rate entries.

CHP Analyses:

The eight CHP divisions were surveyed and summer 2005 usage rates for AUTOMOBILES ONLY (Tables 1 through 10) are tabled for years 2001 to the summer of 2005. Driver rates ranged from the middle 92% to 97%; passenger rates were from the high 94% to a low of 88% and were higher than the spring rates. Standard errors for drivers and passengers were within NHTSA guidelines in most cases.

Infant/toddler rates ranged from the 77% to 94%, but as with the main survey, their sample sizes were very low and standard errors very large reducing the precision and interpretation of these findings.

When CHP division rates were combined (last row of Table 10) the CHP summer driver rate increased to 93.03% from the spring, 2005 of 91.39% and was a significant increase. The combined rates for individual CHP divisions can be viewed in Table 10.

APPENDIX I

Bibliography

Assembly of Statistical Reports 1991.
Business, Transportation, & Housing Agency, Dept. of Trans., Division of Traffic Operations, State of California

Betancourt, Raul
Probability Sampling Design for Estimating Seat Belt Usage Rates in the State of California, OTS & NHTSA, 07/30/92

California Road Atlas & Driver's Guide.
Thomas Brothers Maps, Irvine, Calif., 1991

Fuller, Wayne A., Kennedy, W., Schnell, D. Sullivan, G., & Park, H.J.
PC CARP
Statistical Laboratory, Iowa State University, Iowa June 1989

Hansen, Morris H., Horwitz, William N., & Madow, William G.
Sample Survey Methods & Theory. Vols I & II
John Wiley & Sons, N.Y. 1953

Henry Gary T.
Practical Sampling. Applied Social Research Methods Series #21
Sage Publishing, 1990

Kish, Leslie
Survey Sampling, John Wiley & Sons, N.Y., 1967

Lee, Eun Sul, Forthofer, Ronald N., & Lorimor, Ronald J.
Analyzing Complex Survey Data, #71, Sage Publishing, 1989

Northern California Atlas & Gazetteer
DeLorme Mapping Co., (2nd Ed.). Freeport, Maine 1988

Southern California Atlas & Gazetteer
DeLorme Mapping Co., (2nd Ed.). Freeport, Maine, 1988

1991 Traffic Volumes on the California State Highway System.
Business, Transportation, & Housing Agency, Dept. of Trans., Division of Traffic Operations, State of California

APPENDIX II

OTS OP-9301
DATA CODING FORM
REVISION FOR SPRING 1995

SEASON: _____

\OTS\PLAN\CODFRM95 DATE: _____

==========

1 STRATUM _____ XX STRATUM ID (FROM 01 TO 160)

3 CLUSTER _____ X CLUSTER ID (EITHER 1 OR 2)

4 VEH WEIGHT_____VEHICLE WEIGHT (12 CHAR.)

16 MC/INF WT._____MC/INFANT WT. (12 CHAR.0

28 SITE ID _____ XXX SITE ID FROM 001 TO 200

31 PAIRED ID _____ XXX ID OF PAIRED SITE (NNN)

34 TYPE: H _____ X 1=HIGHWAY SITE; 0=NOT

35 TYPE: NH _____ X 1=NON-HIGHWAY SITE; 0=NOT

36 ADT _____ XXXXXX ADT FIGURES (6 DIGETS)

42 R _____ XX R IS THE NUMBER OF ROADWAYS IN AREA

44 AH _____ XX AH IS NUMBER OF NULLS IN SELECTING SITES

46 SEASON _____ XXX SEASON/YEAR 1=SPRING 2=FALL AND YEAR IS NN (EX: 293 IS SPRING 93)

49 TIME _____ XXX MINUTES SPENT ON SITE

52 SAMPLE SZ _____ XXX SAMPLE SIZE FOR THIS SITE

55 OBSV 1 _____ XXXX OBSERVER ID (N N N N)

59 OBSV 2 _____ XXXX

63 CHP DIV _____ X

INDIVIDUAL OBSERVATIONAL DATA

---

64 VEHICLE X 1=AUTO; 2=VAN; 3=PICKUP; 4=MC; 5=SCOOTER

65 DRV BELT X BELTED=1 NOT BELTED=9

66 PASS BELT X BELTED=1 NOT BELTED=9 NO PASS='BLANK'

67 INFANT BLT X BELTED=1 NOT BELTED=9 NO INFANT='BLANK'

==========

SITE DESCRIPTION: SAMPLING RATE : 1 TO _____

APPENDIX III

CODES

	VEH	DRIVER	PASS	INFANT
	----	----	----	----
BELTED 1				
	----	----	----	----
NOT BELTED 9	----	----	----	----
	----	----	----	----
NO PASS. OR INFANT = 'BLANK'				
	----	----	----	----

VEHICLE

	----	----	----	----
AUTO 1	----	----	----	----
VAN 2	----	----	----	----
PICK UP 3	----	----	----	----
_____	----	----	----	----
LOCATION				
	----	----	----	----
_____				
CITY DATE				
	----	----	----	----
DAY: SU M TU W TH FR SAT				
	----	----	----	----
AM				
TIME: BEGIN____:____PM	----	----	----	----
AM				
TIME: END____:____PM	----	----	----	----
	----	----	----	----
_____				
OBSV 1				
_____	----	----	----	----
OBSV 2				
	----	----	----	----

CODESHT.REV

File Name = Summer Survey 2005 Report